

RECEIVED

JUN 21 2001

HJG  
6/21/01  
1647

TECH CENTER 1600/2900

S. Weeger  
RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/694,777

DATE: 05/30/2001

TIME: 15:31:25

Input Set : A:\Mpg8.app  
Output Set: C:\CRF3\05302001\I694777.raw

PS

3 <110> APPLICANT: PARDO-FERNANDEZ, LUIS ANGEL  
 4 STUHMER, WALTER  
 5 BECKH, SYNNOVE  
 6 BRUGGEMANN, ANDREA  
 7 FERNANDEZ-MIRANDA, DONATO DEL CAMINO  
 8 PEREZ, ARACELI SANCHEZ  
 9 WESELOH, RUDIGER  
 11 <120> TITLE OF INVENTION: NOVEL HUMAN K<sup>+</sup> ION CHANNEL AND THERAPEUTIC APPLICATIONS  
 THEREOF  
 12  
 14 <130> FILE REFERENCE: MPG-8  
 16 <140> CURRENT APPLICATION NUMBER: 09/694,777  
 17 <141> CURRENT FILING DATE: 2000-10-23  
 19 <150> PRIOR APPLICATION NUMBER: PCT/EP99/02695  
 20 <151> PRIOR FILING DATE: 1999-04-21  
 22 <150> PRIOR APPLICATION NUMBER: EP 98 10 7268.9  
 23 <151> PRIOR FILING DATE: 1998-04-21  
 25 <160> NUMBER OF SEQ ID NOS: 15  
 27 <170> SOFTWARE: PatentIn Ver. 2.1  
 29 <210> SEQ ID NO: 1  
 30 <211> LENGTH: 3002  
 31 <212> TYPE: DNA  
 32 <213> ORGANISM: Homo sapiens  
 34 <400> SEQUENCE: 1  
 35 aattccgggc ccgccggacc ccgagctgct gggaggatga ccatggctgg gggcaggagg 60  
 36 ggactagtgg cccctcaaaa cacgttctg gagaatattg ttccggcggtc caatgatact 120  
 37 aattttgtgt tggggaatgc tcagatagtg gactggcta ttgtgtacag caatgatgga 180  
 38 ttttgcagtc tgtctggcta tcacagggca gaagtgtatgc aaaaaagcac cacctgcagt 240  
 39 ttatgtatg gggagctgac tgataaaagac acgattgaaa aagtgcggca aacatttgag 300  
 40 aactatgaga tgaattcctt taaaattctg atgtacaaga agaacaggac acctgtgtgg 360  
 41 ttctttgtga aaattgctcc aattcgaaac gaacaggata aagtggttt atttctttgc 420  
 42 actttcagtg acataaacagc tttcaaacag ccaatttgagg atgattcatg taaaggctgg 480  
 43 gggaaagtttgc tccggctgac aagagcactg acaagcagca ggggtgtcct gcagcagctg 540  
 44 gctccaagcg tgcaaaaagg cgagaatgtc cacaagcact cccgcctggc agaggtccta 600  
 45 cagctgggct cagacatcct tccccagtagc aagcaagagg caccaaagac tccccctcac 660  
 46 atcatcttac attattgtgt ttttaagacc acgtgggatt ggtatcatctt gatcttgacc 720  
 47 ttctatacag ccatttttgtt cccttataat gtctccttca aaaccaggca gaataatgtg 780  
 48 gcctggctgg ttgttgatag catcgtagat gttatctttt tggtgacat tggctcaat 840  
 49 tttcataccca cctttgttgg accagcaggc gaggtgattt ctgaccccaa acttatccgc 900  
 50 atgaactacc tgaagacgtg gtttggat gaccttctgt cctgtttgcc atatgtatgc 960  
 51 atcaacagctt ttgagaacgt ggatgaggc atcagcagcc tggctcagtc tctaaaagtt 1020  
 52 gtcggctgc tccgttgg gcgagtggcc cgtaagctgg accactacat tgaatatgga 1080  
 53 gctgctgtgc tggctctgct ggtgtgtgt tttggctgg ctgcacactg gatggcctgc 1140  
 54 atctggtaca gcattggga ctatgagatc ttgcacgagg acaccaagac aatccgcaac 1200  
 55 aacagctggc tggatggact agcgatggac attggcaccc cttaccagtt taatgggtct 1260  
 56 ggctcaggaa agtgggaagg tggcccagc aagaattctg tctacatctc ctcgttgat 1320  
 57 ttccacaatga ccagcctcac cagtgtggc ttggaaaca tcgccccatc cacagacatt 1380  
 58 gagaagatct ttgcagtggc catcatgtatg attggctcac ttctctatgc caccatcttc 1440

ENTERED

RAW SEQUENCE LISTING  
PATENT APPLICATION: US/09/694,777

DATE: 05/30/2001  
TIME: 15:31:25

Input Set : A:\Mpg8.app  
Output Set: C:\CRF3\05302001\I694777.raw

59 gggaatgtga cgactatttt ccaacagatg tatgccaaca ccaacagata ccatgagatg 1500  
 60 ctcaacagtg ttcggactt cctgaagctc taccaggatc caaaaggatt gagtgagcga 1560  
 61 gtaatggatt atattgtgc cacttggcc atgtccagag gcattgacac agagaaggtc 1620  
 62 ctgcagatct gccccaaagga catgagagcc gacatctgcg tgcacctgaa ccgcaagggtg 1680  
 63 ttcaaggagc acccggcctt cccgctggcc agtcatggct gcctccggc actggccatg 1740  
 64 gagttccaga cggtgactg tgccccaggg gacctcatct accatgcagg agagagcggt 1800  
 65 gacagcctct gctttgttgt ttctggctcc ctggaggtga tccaagatga tgaggtggtg 1860  
 66 gccattctag gaaaaggaga cgtgtttgga gatgtttctt ggaaggaaagc cacccttgcc 1920  
 67 cagtcctgtg ccaatgttag ggccttgacc tactgtgatc tgcatgtat caagcgggat 1980  
 68 gccctgcaga aagtgtgga attctacacg gccttctccc attccttctc ccgaaacctg 2040  
 69 attctgacgt acaactttaga gaagaggatt gtgtccgga agatcagcga tgtgaaacgt 2100  
 70 gaagaggaag aacgcataa acgaaagaat gaggcccccc tgatctgcc cccggaccac 2160  
 71 cctgtccggc gccttccca gagattccga cagcagaaag aggccagct ggcagctgag 2220  
 72 agagggggcc gggacactgga tgaccttagat gtggagaagg gcaatgtct tacagagcat 2280  
 73 gcctccgcca accacagcct cgtgaaggcc agcgtggta ccgtgcgtga gactcctgcc 2340  
 74 acgcccgtat cttccaggc agcctccacc tccggggc cagaccacgc aaagctacag 2400  
 75 gcccagggt ccgagtgctt gggccccaag gggggcgggg gcgattgtgc caagcgc当地 2460  
 76 agctgggccc gcttcaaaga tgcttgcggg aagagtgagg actggaacaa ggtgtccaag 2520  
 77 gctgagtcga tggagacact tcccgagagg acaaaagcgt caggcgaggg cacactgaag 2580  
 78 aagacagact cgtgtacag tggcatcacc aagagcact tgccctgga caacgtgggt 2640  
 79 gaggccagga gtccccagga tcggagtccc atcctggcag aggtcaagca ttctttctac 2700  
 80 cccatccctg agcagacgct gcaggccaca gtcctggagg tgaggcacga gctgaaggag 2760  
 81 gacatcaagg ctttaaacgc caaaatgacc aatattgaga aacagctctc tgagataactc 2820  
 82 agatattaa cttccagaag atcctctcag tctcttcagg agttgttga aatatcgagg 2880  
 83 ccacagtccc cagaatcaga gagagacatt ttggagcca gctgagaggt ctattnaaaa 2940  
 84 aaaaagttag agacagatac ctccaaacctt ggcgtcacca ccaccctac caccggaat 3000  
 85 tc 3002  
 88 <210> SEQ ID NO: 2  
 89 <211> LENGTH: 3083  
 90 <212> TYPE: DNA  
 91 <213> ORGANISM: Homo sapiens  
 93 <400> SEQUENCE: 2  
 94 aattccgggc ccggccgacc ccgagctgt gggaggatga ccatggctgg gggcaggagg 60  
 95 ggactagtgg cccctcaaaa cacgtttctg gagaatattt ttcggcgtc caatgataact 120  
 96 aattttgtgt tggggaatgc tcagatagtg gactggctt ttgtgtacag caatgtatgg 180  
 97 ttttgcacgc tgcgtggcta tcacaggcga gaagtgtatgc aaaaaagcag caccgtcact 240  
 98 tttatgtatg gggagctgac tgataaagac acgattgaaa aagtgcggca aacatttgag 300  
 99 aactatgaga tgaattcctt tggaaattctg atgtacaaaga agaacaggac acctgtgtgg 360  
 100 ttctttgtga aaattgtctt aattcgaaac gaacaggata aagtgggtt atttctttgc 420  
 101 actttcagtg acataaacgc tttcaaaacag ccaattgagg atgattcatg taaaggctgg 480  
 102 gggaaatgg ctcggctgac aagagcactg acaagcagca ggggtgtcct gcagcagctg 540  
 103 gctccaagcg tgcaaaaagg cgagaatgtc cacaagcact cccgcctggc agaggtccta 600  
 104 cagctggctt cagacatcct tccccagtt aagcaagagg caccggaaatc tccccctcac 660  
 105 atcatcttac attattgtgt tttaagacc acgtggattt ggatcatctt gatcttgacc 720  
 106 ttctatacag ccatcttggt cccttataat gtctccttca aaaccaggca gaataatgtg 780  
 107 gcctggctgg ttgttgatag catcgtgtat gttatctttt tgggtggacat tggctcaat 840  
 108 tttcatacca cctttgttgg accagcaggc gaggtgattt ctgaccctaa acttatccgc 900  
 109 atgaactacc tgaagacgtg gtttgcgtt gacccctgt cctgtttgcc atatgtatgtc 960  
 110 atcaacgctt ttgagaacgtt ggttgcgtt aatgtatgtc tgggtgatcc agggaaatgtt 1020

RAW SEQUENCE LISTING  
PATENT APPLICATION: US/09/694,777

DATE: 05/30/2001  
TIME: 15:31:25

Input Set : A:\Mpg8.app  
Output Set: C:\CRF3\05302001\I694777.raw

```

111 ggtttgctg atcagattcc accaccactg gaggggagag agagtcaggg catcagcagc 1080
112 ctgttcaagt ctctaaaagt tgtccggctg ctccgtcttg ggcgagtgcc ccgtaaatctg 1140
113 gaccactaca ttgaatatgg agctgtctgt ctgtcctgc tgggtgtgt gtttgggctg 1200
114 gctgcacact ggtatggctg catctggta agcattgggg actatgagat ctttgcacag 1260
115 gacaccaaga caatccgaa caacagctgg ctgtaccaac tagcgatgga cattggcacc 1320
116 ctttaccagt ttaatgggtc tggctcagg aagtgggaag gtggtcccag caagaattct 1380
117 gtctacatct ctcgttgta tttcacaatg accagcctca ccagtgtggg ctttgggaaac 1440
118 atcgccccat ccacagacat tgagaagatc tttgcagtgg ccacatcatgat gattggctca 1500
119 cttctctatg ccaccatctt cggaatgtg acgactatcc tccaacagat gtatgccaac 1560
120 accaacagat accatgagat gctcaacagt gttcggact tcctgaagct ctaccagggt 1620
121 caaaaaggat tgagttagcg agtaatggat tatattgtgt ccacttggc catgtccaga 1680
122 ggcattgaca cagagaaggt cctgcagatc tgccccaagg acatgagagc cgacatctgc 1740
123 gtgcacctga accgcaaggt gttcaaggag caccggcct tccggctggc cagtgtggc 1800
124 tgcctccggg cactggccat ggagttccag acgtgtcaact gtgcccagg ggacctcatc 1860
125 taccatgcag gagagagcgt tgacagcctc tgcttggc tttctggc cctggagggt 1920
126 atccaagatg atgaggtggt ggccattcta ggaaaaggag acgtgtttgg agatgtgttc 1980
127 tggaaaggaaag ccacccttgc ccagtctgt gccaatgtt gggccttgac ctactgtgat 2040
128 ctgcattgtga tcaagcggga tgccctgcag aaagtgtcgg aattctacac ggccttctcc 2100
129 cattcattct cccgaaacct gattctgac tacaacttga ggaagaggat tgggttccgg 2160
130 aagatcagcg atgtgaaacg tgaagagaa gaacgcatga aacgaaagaa tgaggcccc 2220
131 ctgatcttgc cccggacca ccctgtccgg cgcccttcc agagattccg acagcagaaa 2280
132 gaggccaggc tggcagctga gagagggggc cggacctgg atgacctaga tgggagaag 2340
133 ggcaatgtcc ttacagagca tgccctccgcc aaccacagcc tcgtgaaggc cagcgtggc 2400
134 accgtgcgtg agagtcctgc cacgccccgtc tccttccagg cagcctccac ctccgggggt 2460
135 ccagaccacg caaagctaca ggcgccagg tccgagtgtcc tggggcccaa gggggccggg 2520
136 ggcattgtg ccaagcgc当地 aagctggcc cgcttcaaaat atgcttgccg gaagagttag 2580
137 gacttggaca aggtgtccaa ggctgagtcg atgagacac ttcccggagag gacaaaagcg 2640
138 tcaggcgagg ccacactgaa gaagacagac tcgtgtgaca gtggcatcac caagagcgc 2700
139 ttgcgcctgg acaacgtggg tgaggccagg agtccccagg atcggagtcc catcctggca 2760
140 gaggtcaagc attgttctt cccatccct gacacagcc tcgtggccac agtccctggag 2820
141 gtgaggcaccg agctgaagga ggacatcaag gccttaaacg caaaaatgac caatattgag 2880
142 aaacagctct ctgagatact caggatatta acttccagaa gatcctctca gtctcctcag 2940
143 gagttgtttg aaatatcgag gccacagtcc ccagaatcag agagagacat tttggagcc 3000
144 agctgagagg tctattnaa aaaaaagtcg gagacagata cctccaaaccc tggcgtcacc 3060
145 accaccctta ccacccggaa ttc 3083
148 <210> SEQ ID NO: 3
149 <211> LENGTH: 962
150 <212> TYPE: PRT
151 <213> ORGANISM: Homo sapiens
153 <400> SEQUENCE: 3
154 Met Thr Met Ala Gly Gly Arg Arg Gly Leu Val Ala Pro Gln Asn Thr
155 1 5 10 15
157 Phe Leu Glu Asn Ile Val Arg Arg Ser Asn Asp Thr Asn Phe Val Leu
158 20 25 30
160 Gly Asn Ala Gln Ile Val Asp Trp Pro Ile Val Tyr Ser Asn Asp Gly
161 35 40 45
163 Phe Cys Lys Leu Ser Gly Tyr His Arg Ala Glu Val Met Gln Lys Ser
164 50 55 60
166 Ser Thr Cys Ser Phe Met Tyr Gly Glu Leu Thr Asp Lys Asp Thr Ile

```

**RAW SEQUENCE LISTING**  
**PATENT APPLICATION: US/09/694,777**

**DATE: 05/30/2001**  
**TIME: 15:31:25**

**Input Set : A:\Mpg8.app**  
**Output Set: C:\CRF3\05302001\I694777.raw**

167	65	70	75	80												
169	Glu	Lys	Val	Arg	Gln	Thr	Phe	Glu	Asn	Tyr	Glu	Met	Asn	Ser	Phe	Glu
170							85			90						95
172	Ile	Leu	Met	Tyr	Lys	Lys	Asn	Arg	Thr	Pro	Val	Trp	Phe	Phe	Val	Lys
173							100			105						110
175	Ile	Ala	Pro	Ile	Arg	Asn	Glu	Gln	Asp	Lys	Val	Val	Leu	Phe	Leu	Cys
176							115			120						125
178	Thr	Phe	Ser	Asp	Ile	Thr	Ala	Phe	Lys	Gln	Pro	Ile	Glu	Asp	Asp	Ser
179							130			135						140
181	Cys	Lys	Gly	Trp	Gly	Lys	Phe	Ala	Arg	Leu	Thr	Arg	Ala	Leu	Thr	Ser
182	145						150				155					160
184	Ser	Arg	Gly	Val	Leu	Gln	Gln	Leu	Ala	Pro	Ser	Val	Gln	Lys	Gly	Glu
185							165			170						175
187	Asn	Val	His	Lys	His	Ser	Arg	Leu	Ala	Glu	Val	Leu	Gln	Leu	Gly	Ser
188							180			185						190
190	Asp	Ile	Leu	Pro	Gln	Tyr	Lys	Gln	Glu	Ala	Pro	Lys	Thr	Pro	Pro	His
191							195			200						205
193	Ile	Ile	Leu	His	Tyr	Cys	Val	Phe	Lys	Thr	Thr	Trp	Asp	Trp	Ile	Ile
194							210			215						220
196	Leu	Ile	Leu	Thr	Phe	Tyr	Thr	Ala	Ile	Leu	Val	Pro	Tyr	Asn	Val	Ser
197	225						230				235					240
199	Phe	Lys	Thr	Arg	Gln	Asn	Asn	Val	Ala	Trp	Leu	Val	Val	Asp	Ser	Ile
200							245			250						255
202	Val	Asp	Val	Ile	Phe	Leu	Val	Asp	Ile	Val	Leu	Asn	Phe	His	Thr	Thr
203							260			265						270
205	Phe	Val	Gly	Pro	Ala	Gly	Glu	Val	Ile	Ser	Asp	Pro	Lys	Leu	Ile	Arg
206							275			280						285
208	Met	Asn	Tyr	Leu	Lys	Thr	Trp	Phe	Val	Ile	Asp	Leu	Leu	Ser	Cys	Leu
209							290			295						300
211	Pro	Tyr	Asp	Val	Ile	Asn	Ala	Phe	Glu	Asn	Val	Asp	Glu	Gly	Ile	Ser
212	305						310				315					320
214	Ser	Leu	Phe	Ser	Ser	Leu	Lys	Val	Val	Arg	Leu	Leu	Arg	Leu	Gly	Arg
215							325			330						335
217	Val	Ala	Arg	Lys	Leu	Asp	His	Tyr	Ile	Glu	Tyr	Gly	Ala	Ala	Val	Leu
218							340			345						350
220	Val	Leu	Leu	Val	Cys	Val	Phe	Gly	Leu	Ala	Ala	His	Trp	Met	Ala	Cys
221							355			360						365
223	Ile	Trp	Tyr	Ser	Ile	Gly	Asp	Tyr	Glu	Ile	Phe	Asp	Glu	Asp	Thr	Lys
224							370			375						380
226	Thr	Ile	Arg	Asn	Asn	Ser	Trp	Leu	Tyr	Gln	Leu	Ala	Met	Asp	Ile	Gly
227	385						390				395					400
229	Thr	Pro	Tyr	Gln	Phe	Asn	Gly	Ser	Gly	Ser	Gly	Lys	Trp	Glu	Gly	Gly
230							405			410						415
232	Pro	Ser	Lys	Asn	Ser	Val	Tyr	Ile	Ser	Ser	Leu	Tyr	Phe	Thr	Met	Thr
233							420			425						430
235	Ser	Leu	Thr	Ser	Val	Gly	Phe	Gly	Asn	Ile	Ala	Pro	Ser	Thr	Asp	Ile
236							435			440						445
238	Glu	Lys	Ile	Phe	Ala	Val	Ala	Ile	Met	Met	Ile	Gly	Ser	Leu	Leu	Tyr
239							450			455						460

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/694,777

DATE: 05/30/2001

TIME: 15:31:25

Input Set : A:\Mpg8.app  
 Output Set: C:\CRF3\05302001\I694777.raw

241 Ala Thr Ile Phe Gly Asn Val Thr Thr Ile Phe Gln Gln Met Tyr Ala  
 242 465 470 475 480  
 244 Asn Thr Asn Arg Tyr His Glu Met Leu Asn Ser Val Arg Asp Phe Leu  
 245 485 490 495  
 247 Lys Leu Tyr Gln Val Pro Lys Gly Leu Ser Glu Arg Val Met Asp Tyr  
 248 500 505 510  
 250 Ile Val Ser Thr Trp Ser Met Ser Arg Gly Ile Asp Thr Glu Lys Val  
 251 515 520 525  
 253 Leu Gln Ile Cys Pro Lys Asp Met Arg Ala Asp Ile Cys Val His Leu  
 254 530 535 540  
 256 Asn Arg Lys Val Phe Lys Glu His Pro Ala Phe Arg Leu Ala Ser Asp  
 257 545 550 555 560  
 259 Gly Cys Leu Arg Ala Leu Ala Met Glu Phe Gln Thr Val His Cys Ala  
 260 565 570 575  
 262 Pro Gly Asp Leu Ile Tyr His Ala Gly Glu Ser Val Asp Ser Leu Cys  
 263 580 585 590  
 265 Phe Val Val Ser Gly Ser Leu Glu Val Ile Gln Asp Asp Glu Val Val  
 266 595 600 605  
 268 Ala Ile Leu Gly Lys Gly Asp Val Phe Gly Asp Val Phe Trp Lys Glu  
 269 610 615 620  
 271 Ala Thr Leu Ala Gln Ser Cys Ala Asn Val Arg Ala Leu Thr Tyr Cys  
 272 625 630 635 640  
 274 Asp Leu His Val Ile Lys Arg Asp Ala Leu Gln Lys Val Leu Glu Phe  
 275 645 650 655  
 277 Tyr Thr Ala Phe Ser His Ser Phe Ser Arg Asn Leu Ile Leu Thr Tyr  
 278 660 665 670  
 280 Asn Leu Arg Lys Arg Ile Val Phe Arg Lys Ile Ser Asp Val Lys Arg  
 281 675 680 685  
 283 Glu Glu Glu Arg Met Lys Arg Lys Asn Glu Ala Pro Leu Ile Leu  
 284 690 695 700  
 286 Pro Pro Asp His Pro Val Arg Arg Leu Phe Gln Arg Phe Arg Gln Gln  
 287 705 710 715 720  
 289 Lys Glu Ala Arg Leu Ala Ala Glu Arg Gly Gly Arg Asp Leu Asp Asp  
 290 725 730 735  
 292 Leu Asp Val Glu Lys Gly Asn Val Leu Thr Glu His Ala Ser Ala Asn  
 293 740 745 750  
 295 His Ser Leu Val Lys Ala Ser Val Val Thr Val Arg Glu Ser Pro Ala  
 296 755 760 765  
 298 Thr Pro Val Ser Phe Gln Ala Ala Ser Thr Ser Gly Val Pro Asp His  
 299 770 775 780  
 301 Ala Lys Leu Gln Ala Pro Gly Ser Glu Cys Leu Gly Pro Lys Gly Gly  
 302 785 790 795 800  
 304 Gly Gly Asp Cys Ala Lys Arg Lys Ser Trp Ala Arg Phe Lys Asp Ala  
 305 805 810 815  
 307 Cys Gly Lys Ser Glu Asp Trp Asn Lys Val Ser Lys Ala Glu Ser Met  
 308 820 825 830  
 310 Glu Thr Leu Pro Glu Arg Thr Lys Ala Ser Gly Glu Ala Thr Leu Lys  
 311 835 840 845  
 313 Lys Thr Asp Ser Cys Asp Ser Gly Ile Thr Lys Ser Asp Leu Arg Leu

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

**VERIFICATION SUMMARY**

PATENT APPLICATION: US/09/694,777

DATE: 05/30/2001

TIME: 15:31:26

Input Set : A:\Mpg8.app  
Output Set: C:\CRF3\05302001\I694777.raw

L:580 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8